

# Building on Motorola Xoom

## NOTICE!

**It is possible on devices with android 4.3 and later that selinux is enabled by default!** This means you may not be able to use OpenCPN when installed per my instructions. Guaranteed that if you are using a device with the Lollipop OS, selinux is enabled! In a typical computer installation, linux selinux settings are user controlled and commands are available to change the way selinux affects an applications access to files. Not so with android. Your choices are 1.) to purchase a device with a pre-android 4.3 O.S. or 2.) install a custom ROM without selinux enabled.

**It is probable that Linux Deploy and VNC viewers will be changed to work in a selinux enabled ROM environment, but how quickly is unknown by me at this time. When that happens I'll remove this warning.**

**Introductory Note:** Although this article refers specifically to the Motorola Xoom, it is likely that if you own any brand of device with the armel architecture the instructions herein will enable you to install Linux and OpenCPN on your device.

## Step 1

You should determine what type of CPU (central processing unit) your device has before choosing a linux distribution for installation. To use an armhf distribution your device must have at least an armv7 architecture. Refer on your device to "Settings" > "About Tablet" > "CPU" which should provide this information.

The primary difference between devices will be the method used to unlock your bootloader (root the device). If a method for rooting your device cannot be found here: [Android & Windows Phone: Tablets, Apps, & ROMs @ xda-developers](https://xda-developers.com) , then use your browser's search engine inserting your model with the word root or rooting. You are bound to find a method somewhere. There is no way I can know about all of the various approaches used to root different android devices. Consequently the method you use may not include instructions to install SuperSu, an android app downloadable from Google Play. If your instructions neglect to mention this application, go to Google Play, download and install SuperSu.

### **An important note concerning "SuperSu":**

Depending on your version of android, SuperSu is either installed separately from the ROM, or as in the case of custom ROMs from Cyanogenmod, SuperSu and 'Privacy Guard' are included in the ROM. ROM=Operating system.

Access by applications to system files is controlled by SuperSu. The Privacy Guard is used to prohibit applications from accessing your 'private data'. Both are user controlled.

If the rooting process you used required the installation of SuperSu separately, there will be a SuperSu icon on the android desktop where all applications reside. However, sometimes it will also appear on your customized desktop where you've placed frequently used applications.

Tapping on the icon opens the SuperSu app. Go to the settings. Scroll Waaaay down toward the bottom until you see something akin to 'enable SuperSu Pro'. Enable this option. Right, you don't need to buy the Pro version because while the developers appreciate people who do, they also realize the indispensable need by owners of rooted devices to use the app.

In Cyanogenmod's Custom ROMs, the SuperSu and Privacy Guard options are accessed through your device 'Settings', typically opened by tapping on a gear type icon... Confirm under #  
Superuser>Settings>Multi User Policy>All users can request Superuser; Superuser Access>Apps only.

If Privacy Guard is enabled for Linux Deploy, it may not work. So, make certain Privacy Guard is not active for Linux Deploy. Installed seperately, the 'Pro' version must be enabled.

Whenever an app requiring access to system files is opened the first time, SuperSu will appear asking you what to do. Grant or Deny access to the app? Permanently, or for some pre-determined amount of time? If this did not happen when you first opened, or tried to do something with Linux Deploy that required access to system files, it's most likely related to my discussion above.

**\*NOW, CONNECT TO THE INTERNET\***

## Step 2

Using the Google Play application, download the following applications from Google Play.

- "Linux Deploy" ( see: <https://github.com/meefik/linuxdeploy> for sparse instructions).
- "Android Terminal Emulator" The terminal is used to download and install file dependencies and OpenCPN.
- "bVNC Free" The viewer is necessary to access your Linux desktop.
- "FX File Manager and FX File Manager Root Extension
- GPS Share WIFI
- GPS TEST

About GPS: If properly configured, built in, external usb, wireless and bluetooth gps will all work in OpenCPN. If using the built in android gps follow these steps:

- In your android 'Settings' enable "Location" to start the gps. The wireless network need not be enabled. DO NOT ENABLE YOUR DEVICE HOTSPOT!
- Open the application GPS TEST so you can observe gps activity.
- Open GPS Share WIFI. Tap on 'setting'>Local Port. Note the port number which is 12776 by default. You will use this port number in OpenCPN.
- Return in GPS Share WIFI to 'start' and tap on the green button. The button colour will change and provided your gps has a fix the lat/long will display.

- In OpenCPN select 'network', port 12776 and address 'localhost'. Tap on 'apply' then 'close'. You should see the icon in upper right corner showing green vertical bars and the ownship will move to your current location.

For more about gps refer to “Advanced and other information section at the end of this document.

## Step 3

Using “Linux Deploy” , tap on the downward pointing arrow. Under 'Deploy' tap on 'Distribution' and select “Ubuntu”. Under “Distribution Suite” select “Precise” and under “Desktop” select “Xfce”.

**NOTE:** Tap on three vertical dots>Settings and check the default Linux Deploy setting “ENV directory” to see whether it is **/data/local/linux** or **/data/data/ru.meefik.linuxdeploy/linux**. If it is **/data/data/ru.meefik.linuxdeploy/linux** substitute this for **/data/local/linux** in the instructions wherever it appears! Or, change now to **/data/local/linux**.

Accept the remaining default settings in Linux Deploy. Following a successful installation refer to “More Information” to learn about other options and settings in Linux Deploy.

To install linux using Linux Deploy tap on the downward pointing arrow. Then under 'Action' tap on 'Install'.

Assuming Linux Deploy successfully concludes the installation of Ubuntu Precise complete the steps below. NOTE: Do not include the two ' characters when typing or copying the commands into the android terminal.

Open the “android terminal”.

Type 'su' at the prompt > Press <enter> Copy/paste or type:

```
/data/local/linux/bin/linuxdeploy shell
```

and press <enter>

Important! The next step creates a root password. Use a root password you won't forget! You'll need the password when performing operations in a terminal as the “root operator” in the Linux GUI environment.

Type at the terminal prompt

```
passwd root  
and press <enter>  
Type your password  
and press <enter>  
Re-enter the password as requested.  
and press <enter>
```

## Step 4: Installing OpenCPN

Follow the standard Linux build instructions for Ubuntu/Debian

## Step 5

Using Linux Deploy press the 'start' icon.

Open bVNC Free and confirm the settings are:

- Name: "new Server" or any other name you wish to use,
- IP Address: "localhost",
- Port: "5900",
- Authentication: vnc password. "changeme" (Which can be changed...)
- VNC server type: "Autodetect".
- Operating system type: "Other".

## Step 6

Within bVNC Free 'Connect' to the Window Manager. The Xfce 'desktop' should appear.

## Step 7 Launch OpenCPN

You will most likely find OpenCPN in the main menu under "Education". Click on the OpenCPN icon and the program should start.

## Step 8: Adding Charts

Finally a quote from a Cruisers Forum member regarding charts.:

Although setting up charts inside OpenCPN is part of the main OpenCPN documentation, I think a section here needs to include installing charts in a nice simple way to the device. IMO the easiest method is to copy to the external SD and then make reference how to find this SD card using the File Manager located in the Linux distro. Trying to explain how to copy and move is confusing for new chums and old hands will already know how to do this if that's what they want to do.

Good idea, but the devices/partitions have to be designated in Linux Deploy first. In Linux Deploy tap on the downward pointing arrow. Scroll down to 'Start Up'. Enable 'Custom Mounts'. Tap on Mount Points and proceed to define which partitions you wish to access from the Linux Desktop, OpenCPN and other applications. /storage/sdcard0 and /storage/sdcard1 are two examples.

Enjoy.

Additional information and useful links will be added later.

From:  
<https://opencpn.org/wiki/dokuwiki/> - **OpenCPN Manuals**

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